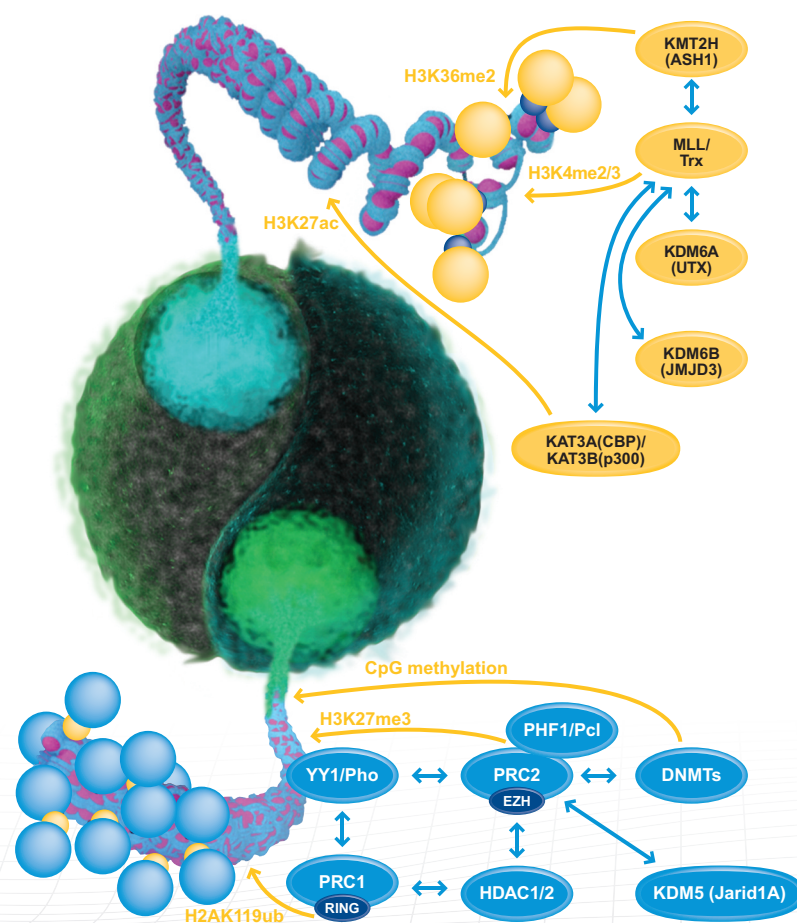
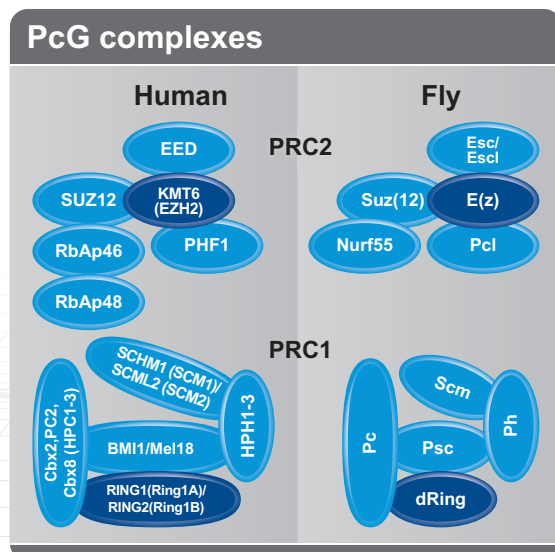
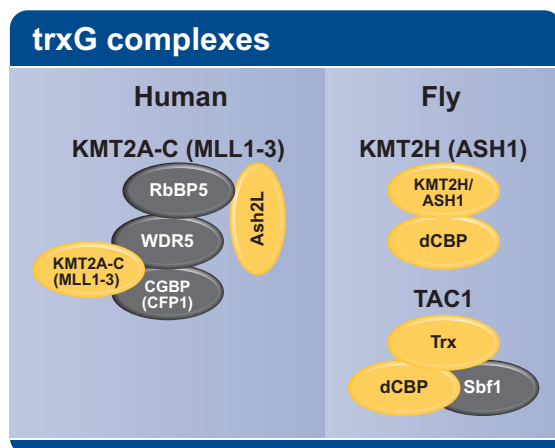
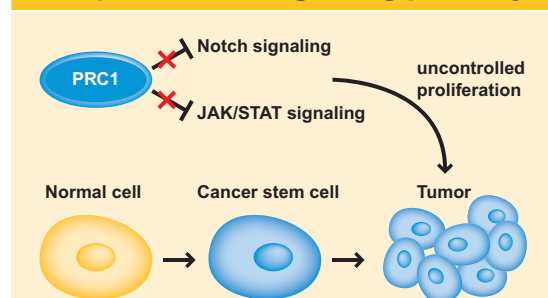


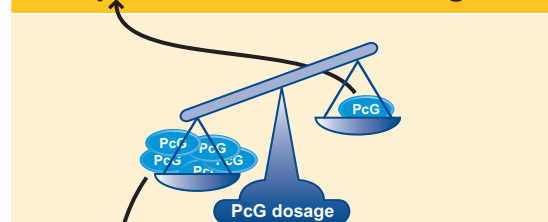
Polycomb group proteins (PcG) and cancer



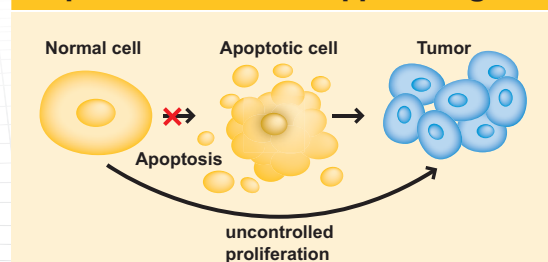
Derepression of signaling pathways

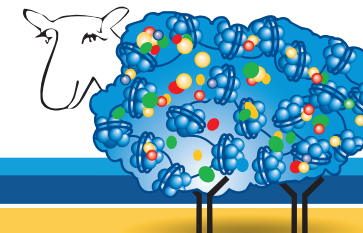


Derepression of self renewal genes



Repression of tumor suppressor genes





Polycomb group proteins (PcGs) and cancer

Deregulation of PcG components has emerged as common hallmark of many cancers. A delicate balance of PcG protein levels ensures proper cell function and normal cell proliferation. Upregulation of PcG proteins like Bmi1 or KMT6 (EZH2) induces repression of tumor suppressor genes (e.g. p16^{ink4a} and p19^{ARF}), resulting in uncontrolled proliferation by interrupting cellular safeguard mechanisms like apoptosis. Repression by PcG complexes involves targeting of PRC2 to chromatin via interaction with DNA binding proteins like YY1/Pho. PRC2-mediated methylation of histone H3K27 is increased by its interaction with PHF1/Pcl, facilitating binding of PRC1, which has H2A ubiquityltransferase activity. In addition, histone H3K4 demethylases KDM5A (Jarid1A) and DNA methyltransferases (DNMTs) are targeted to PcG bound chromatin via their interaction with PRC2.

Decreased levels of PcG proteins can lead to the acquisition of self renewal properties by the activation of self renewal genes. This facilitates the maintenance of cancer stem cells and formation of tumors. In addition, PcG complexes can have tumor suppressor activity and inhibit cell growth by repressing mitogenic signaling pathways.

Reduced levels of PcG components shift the balance towards the antagonistically acting trxG proteins. Gene activation involves methylation of histone H3K4 by MLL/Trx, acetylation of histone H3K27 by KAT3A (CBP)/KAT3B (p300) and methylation of histone H3K36 by KMT2H (Ash1). In addition MLL/Trx interacts with histone H3K27 demethylases KDM6A (UTX) and KDM6B (JMJD3) contributing to gene activity.

PcG and cancer related antibodies from Abcam:

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Product	Clonality	Applications	Host	Species Reactivity	Datasheet www.abcam.com/ab...	Product	Clonality	Applications	Host	Species Reactivity	Datasheet www.abcam.com/ab...
ASH2L	P	ELISA, WB	Rb	Hu, Ms	28426	KAT3A / CBP [AC238] - ChIP Grade	M	ChIP, IHC-Fr, IHC-P, WB	Ms	Hu, Rat	3652
Bmi1	P	WB	Rb	Hu	63767	KAT3B / p300 [NM11]	M	IF, IHC-P, IP, WB	Ms	Hu, Ms, Rat, Mink, Mk, Pig	3164
cbx2	M	WB	Ms	Hu	57890	KDM5A / Jarid1A / RBBP2	P	Fast Track	Rb	Fast Track	26049
Cbx8	P	IP, WB	Rb	Hu	70796	KDM6A / UTX	P	Fast Track	Rb	Fast Track	36938
CGBP	P	ELISA, WB	Rb	Hu, Ms, Rat, Dog	56035	KDM6B / JMJD3	P	Fast Track	Rb	Fast Track	38113
Dnmt1	P	ICC/IF, IHC-P, WB	Rb	Hu, Ms	19905	KMT2A / MLL [mmN4.4]	M	ELISA, IP, WB	Ms	Hu	32400
Dnmt3a [64B1446] - ChIP Grade	M	ChIP, ICC, IF, WB	Ms	Hu, Ms	13888	KMT2B / MLL2	P	Fast Track	Rb	Fast Track	32474
Dnmt3b	P	WB	Rb	Hu, Ms, ChHm	16049	KMT2C / MLL3	P	Fast Track	Rb	Fast Track	32941
Dnmt3b [52A1018] - ChIP Grade	M	ChIP, ICC, IHC-P, IP, WB	Ms	Hu, Ms	13604	KMT2H / Ash1 - ChIP Grade	P	ChIP, IHC-Fr, IHC-P	Rb	Hu, Ms, Corn	4477
EDR1 / PHC1	M	WB	Ms	Hu	54954	KMT6 / EZH2	P	ICC/IF, IHC-FoFr, IHC-P, IP, WB	Rb	Hu, Ms, Cow	3748
EED	P	ICC/IF, IHC-FoFr, IP, WB	Rb	Hu, Cow	4469	Mel18	P	ICC/IF, WB	Rb	Hu	16651
EZH1	P	ELISA, IHC-P, WB	Rb	Hu, Ms	64850	PC2	P	IF, WB	Rb	Hu	4189
HDAC1	P	ICC/IF, IHC-P, WB	Rb	Hu, Ms, Rat	19845	PHC3	P	IP, WB	Rb	Hu	80612
HDAC1 [10E2] - ChIP Grade	M	ChIP, ICC/IF, IP, WB	Ms	Hu, Ms, Rat	46985	PHF1	P	ELISA, WB	Rb	Hu, Ms, Rat	70094
HDAC2	P	ICC/IF, WB	Rb	Hu, Ms, Rat	16032	RbAp46	P	ICC, WB	Rb	Hu, Ms, Mk	3535
HDAC2 [3F3] - ChIP Grade	M	ChIP, ICC/IF, IHC-P, IP, WB	Ms	Hu, Ms, Rat	51832	RbAp48	P	ICC/IF, WB	Rb	Hu, Ms, Rat	47456
Histone H3 (acetyl K27) - ChIP Grade	P	ChIP, ChIP/Chip, ChIPseq, IF, IHC-P, WB	Rb	Hu, Ms, At, Cow, Dm	4729	RbBP5	P	IP, WB	Rb	Hu, Ms	52084
Histone H3 (di methyl K36) - ChIP Grade	P	ChIP, WB	Rb	Hu, Cow, Sc	9049	RING1	P	WB	Rb	Hu, Ms, Rat	32644
Histone H3 (di methyl K4) - ChIP Grade	P	ChIP, ICC/IF, WB	Gt	Hu, Cow	11946	RING2 / RING1B / RNF2	P	WB	Gt	Hu, Ms	3832
Histone H3 (tri methyl K27)	M	ChIP, ChIP/Chip, Flow Cyt, ICC,	Ms	Hu, Ms, Cow, Dm, Plnts, Zfsh	6002	SCMH1	P	ELISA, WB	Rb	Hu	83710
[mAbcam 6002] - ChIP Grade		ICC/IF, IHC-P, WB				SCML2 [SCMAD14A]	M	Dot, WB	Ms	Hu, Ms, Rat	51506
Histone H3 (tri methyl K4)	M	ChIP, ICC, IF, WB	Ms	Hu, Ms, Rat, Cow, Rice	1012	SUZ12 - ChIP Grade	P	ChIP, ChIP/Chip, IP, WB	Rb	Hu, Ms	12073
[mAbcam1012] - ChIP Grade						WDR5	P	WB	Rb	Hu, Ms, Rat	22512
KAT3A / CBP - ChIP Grade	P	ChIP, WB	Rb	Hu, Ms	2832	YY1	P	ICC/IF, IHC-P, WB	Rb	Hu	43058